

2015 Consumer Confidence Report

Water System Name: Madrone Mutual Water Company Report Date: April 3, 2016

We test the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of our monitoring for the period of January 1 - December 31, 2015 and may include earlier monitoring data.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.

Type of water source(s) in use: Groundwater

Name & general location of source(s): Well02 (on standby), Well03 (active), 7746 Isabel Dr., Cotati

Drinking Water Source Assessment information: An assessment of the drinking water sources was completed in 2002. At that time, the sources were considered most vulnerable to Septic Systems (high density > 1/acre).

Time and place of regularly scheduled board meetings for public participation: We hold an annual meeting in the fall. Members are notified via U.S. Mail and email.

For more information, contact: Christopher Brooks (cxbrooks@gmail.com) Phone: (707) 332-0670

TERMS USED IN THIS REPORT

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standards (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Variances and Exemptions: State Board permission to exceed an MCL or not comply with a treatment technique under certain conditions.

ND: not detectable at testing limit

ppm: parts per million or milligrams per liter (mg/L)

ppb: parts per billion or micrograms per liter (µg/L)

ppt: parts per trillion or nanograms per liter (ng/L)

ppq: parts per quadrillion or picogram per liter (pg/L)

pCi/L: picocuries per liter (a measure of radiation)

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- *Inorganic contaminants*, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- *Pesticides and herbicides*, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- *Radioactive contaminants*, that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Tables 1, 2, 3, 4, 5, 7, and 8 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The State Board allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old.

TABLE 1 – SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminants (complete if bacteria detected)	Highest No. of Detections	No. of months in violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria	(In a mo.)	2	More than 1 sample in a month with a detection	0	Naturally present in the environment
Fecal Coliform or <i>E. coli</i>	(In the year)	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or <i>E. coli</i>	0	Human and animal fecal waste

TABLE 2 – SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper (complete if lead or copper detected in the last sample set)	Sample Date	No. of samples collected	90 th percentile level detected	No. sites exceeding AL	AL	PHG	Typical Source of Contaminant
Lead (ppb)	6/10/2013	5	<5	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	6/10/2013	5	0.955	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

TABLE 3 – SAMPLING RESULTS FOR SODIUM AND HARDNESS

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium (ppm)	6/1/2015	39		none	none	Salt present in the water and is generally naturally occurring
Hardness (ppm)	6/1/2015	86		none	none	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

*Any violation of an MCL or AL is asterisked. Additional information regarding the violation is provided later in this report.

TABLE 4 – DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL [MRDL]	PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Barium (Ba) (ppm)	6/1/2015	130		1000		Internal corrosion of asbestos cement water mains; erosion of natural deposits
Chromium (ppb)	6/1/2015	2.0		50		Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Nitrate (as NO ₃) (ppm)	6/1/2015	10.0		45		Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Gross Alpha Particle Activity (pCi/L)	11/4/2007	1.15		15		Erosion of natural deposits
Fluoride (ppm)	6/1/2015	0.33		2.0		Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.

TABLE 5 – DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Chloride (mg/L)	6/1/2015	45		500		Runoff/leaching from natural deposits; seawater influence
Color (Units)	6/1/2015	3.0		15		Naturally-occurring organic materials
Iron (µg/L)	1/6/15, 4/1/15, 10/8/15	593*	520-650	300		Leaching from natural deposits; industrial wastes.
Manganese (µg/L)	1/6/15, 4/1/15, 10/8/15	58*	40-89	50		Leaching from natural deposits
Specific Conductance (µS/cm)	6/1/2015	410		1600		Substances that form ions when in water; seawater influence.
Sulfate (SO ₄) (mg/L)	6/1/2015	36		500		Runoff/leaching from natural deposits; industrial wastes.
Total Dissolved Solids	6/1/2015	270		1000		Runoff/leaching from natural deposits
Turbidity (NTU)	6/1/2015	0.9		5		Soil runoff

TABLE 6 – DETECTION OF UNREGULATED CONTAMINANTS

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	Notification Level	Health Effects Language

*Any violation of an MCL, MRDL, or TT is asterisked. Additional information regarding the violation is provided later in this report.

Additional General Information on Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Lead-Specific Language for Community Water Systems: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Madrone Mutual Water Company is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. [Optional: If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.] If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/lead>.

Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

Summary Information for Violation of a MCL, MRDL, AL, TT, or Monitoring and Reporting Requirement

VIOLATION OF A MCL, MRDL, AL, TT, OR MONITORING AND REPORTING REQUIREMENT				
Violation	Explanation	Duration	Actions Taken to Correct the Violation	Health Effects Language
Iron	We have always had high iron levels. Well 03 has somewhat better levels than our previous well.	Ongoing 01/06/15 – 650 04/01/15 – 520 10/08/15 – 610 Average: 593 ppb	See description below.	The iron MCL was set to protect us against unpleasant aesthetic effects (e.g., color, taste, and odor) and the staining of plumbing.
Manganese	We have always had high manganese levels. Well 03 has somewhat better levels than our previous well.	01/06/15 – 44 04/01/15 – 89 10/08/15 – 40 Average: 58 ppb	See description below.	The notification level for manganese is used to protect consumers from neurological effects. High levels of manganese in people have been shown to result in effects of the nervous system.

Actions taken to Correct the Violation for Iron and Manganese: Note that we are testing quarterly for iron and manganese. If we are found to be over the secondary MCL, then we may choose to apply for a waiver. To get a waiver, we will need to get an estimate for iron and manganese removal, then calculate how much rates would increase and then survey the customers. If the customers decide that we don't want to pay for removal, then we can decline iron and manganese treatment and we will test less often for iron and manganese.

If our levels are more than 3x the secondary MCL, then getting a waiver is not possible. Our iron level is just over 2x the secondary MCL and our manganese level is just over the secondary MCL, so this is not an issue.

Note that if the iron and manganese causes other violations such as iron bacteria in the pipes harboring *E. Coli.*, then we may be required to treat iron and manganese so as to address the other violation.

More About Our Friend, Manganese:

http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Manganese.shtml states

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Drinking Water Notification Level for Manganese

The Division of Drinking Water's (DDW's) drinking water [notification level](#) for manganese is 0.5 milligram per liter (0.5 mg/L). When manganese is present in water served to customers at concentrations greater than the notification level, certain requirements and recommendations apply, as described below.

The notification level applies to all public water systems, whether or not they are covered by the current regulation of manganese.

Current Regulation of Manganese

Manganese is regulated by a 0.05-mg/L secondary maximum contaminant level (MCL) (see [drinking water regulations](#)), a standard established to address issues of aesthetics (discoloration), not health concerns. In California secondary MCLs are enforceable. (USEPA's 0.05-mg/L federal secondary standard for manganese is a non-enforceable guideline.)

Secondary MCLs are enforceable standards in California, but are applicable only to community systems. Thus, noncommunity systems, particularly nontransient noncommunity (NTNC) systems such as schools and workplaces, do not receive the benefits of the secondary standard.

Although the aesthetic effects related to elevated manganese in drinking water are likely to be encountered at concentrations below the notification level, the notification level provides an extra layer of protection to consumers of water from systems subject to the secondary MCL requirements.

Background Information

Manganese is a required nutrient. Table 2.1 in ATSDR (2008) has a table of adequate intake levels for manganese, which range from 1.2 mg/day for 1- to 3-year-old infants, to 1.8 -2.3 mg/day for female and male adults. Values are lower for infants and higher for the pregnant or lactating woman. A healthful diet provides adequate manganese for good nutrition (US EPA, 2003). Reviews of typical Western and vegetarian diets showed typical manganese intakes of 0.7 to 10.9 mg/day (WHO, 2004).

However, manganese at very high levels can pose a neurotoxic risk (ATSDR, 2008; US EPA, 1996, 2003, 2004; WHO, 2004). For example, neurologic damage (mental and emotional disturbances, as well as difficulty in moving—a syndrome of effects referred to as "manganism") has been reported to be permanent among manganese miners and other workers exposed to high levels of airborne manganese for long periods of time. Lower chronic exposures in the workplace resulted in decrements in certain motor skills, balance and coordination, as well as increased memory loss, anxiety, and sleeplessness (ATSDR, 2008). USEPA (1996), in developing an oral reference dose for manganese based on dietary intake, mentions an epidemiological study in Greece that showed an increase in neurologic effects such as weakness and fatigue, disturbances in gait, and neuromuscular effects, in people whose drinking water contained 1.6 to 2.3 mg/L. Uncertainties about the levels of dietary manganese and the amount of drinking water consumed did not enable USEPA to use these data for risk assessment purposes.

ATSDR (2008) reports several studies that showed decreased ability in neurobehavioral performance testing and in several educational parameters, in children exposed to high level of manganese in drinking water and diet for at least several years.

Children are considered to be particularly susceptible to possible effects of high levels of manganese exposure because they absorb and/or retain more manganese than adults (ATSDR, 2008; USEPA, 1996).

Attention to the potential health concerns of high levels of manganese in drinking water is appropriate, as the 0.5-mg/L notification level provides, given the possibility of neurologic effects at very high concentrations. Similar advisory levels for manganese have been established by the US EPA, which has a manganese health advisory level of 0.3 mg/L (USEPA, 2004), and the World Health Organization, which has a manganese health guideline level of 0.4 mg/L (WHO, 2004).

Benefits of a Notification Level for Manganese

A health-based notification level for manganese is helpful in addressing high manganese levels in drinking water sources, in several ways:

- It provides guidance and information to systems with manganese above the secondary MCL, as they deal with the [regulatory requirements associated with exceeding the secondary standard \(PDF\)](#), such as addressing costs associated with treatment.
- It provides guidance to DDW staff in evaluating waivers from treatment requirements to meet the secondary MCL. Currently, consumers are to be surveyed about their acceptance of exceeding a secondary MCL. A notification level allows health-based considerations to enter into the consumer survey and waiver from treatment process.
- It allows consumers of water from NTNC systems to be informed about the potential for health concerns associated with sources that have high levels of manganese.

Requirements and Recommendations

When manganese is present in concentrations greater than the notification level, the following [requirements and recommendations apply](#):

- Systems with drinking water sources with manganese concentrations greater than the notification level are required to notify local city and county governing bodies, just as for other contaminants with notification levels and for contaminants that exceed MCLs.
- Consumer notification is recommended at levels greater than the notification level. This may be handled through the water systems' annual [consumer confidence reports](#). Other means could be used as well, if more appropriate, such as direct mailing, or posting a notice. These should be coordinated with the local DDW [district office](#).
- Source removal is recommended at ten times the notification level.

Monitoring for manganese is required within the framework of [secondary MCL regulations](#), but generally not outside that framework. For sources not subject to the secondary MCL requirements, DDW recommends analyses of sources that are near other sources that have very high manganese levels.

In 2003, when the California Department of Health Services' Drinking Water Program (DDW) established the 0.5-mg/L notification level (then called an "action level") for manganese, we recommended follow-up monitoring for those systems that historically had shown manganese higher than the 0.5-mg/L concentration, but which lacked recent data. Current monitoring allows water systems to confirm earlier values, and to allow them to meet the requirement for notifying its local government body with timely information. If a water system chose not to take a contemporary follow-up sample for manganese analysis, then we recommended notification of the governing body based on prior data. Consumer notification should follow the recommendations mentioned above.

For community systems subject to the secondary MCL monitoring and compliance requirements ([22 CCR §64449](#)) with manganese greater than the notification level, DDW recommends that information about the health concerns associated with high manganese exposures be provided to consumers as part of the required consumer dissatisfaction determination.

Manganese Detections Greater Than 0.5 mg/L

There are ~12,000 sources belonging to ~4,400 community and NTNC systems in California. Historically, about 30 percent of drinking water sources monitoring for manganese have reported manganese detections, reflecting its natural occurrence. The detection limit for purposes of reporting (DLR), the level at which DDW is confident about the quantification of manganese's presence in drinking water, is 0.02 mg/L.

A number of sources have reported detections greater than the 0.05-mg/L secondary MCL. Results from January 2006 through June 15, 2011 from DDW's drinking water quality monitoring data show that 384 sources from 272 systems reported a peak detection above 0.5 mg/L. [For purposes of comparison, There are ~12,000 sources belonging to ~4,400 community and NTNC systems.] Sources with a detection above 0.5 mg/L occurred in 46 of the state's 58 counties, most often in the counties of Sonoma (61 sources), Napa (23), San Diego (21), Santa Barbara (18), Lake (16), and San Luis Obispo (15).

Drinking Water Sources with Manganese Detected above 0.5-mg/L*			
Concentration	No. of Sources	No. of Systems	No. of Counties
Mn > 0.5 mg/L	384	272	46
*These data are from manganese detections above 0.5 mg/L (Excel) (January 2006 - June 2011). In determining the number of sources for this table, inactive wells, abandoned and destroyed wells, agricultural wells, and monitoring wells were excluded. These data will change with subsequent updates, so they should be considered draft.			

The peak concentrations should not be viewed as indicative of the levels of manganese in drinking water served to consumers. Readers interested in the levels of manganese in their drinking water should refer to their water systems' annual Consumer Confidence Reports (CCRs). A number of CCRs for California water systems are available on the [US EPA's website](#).

References

- [ATSDR, 2008](#), Toxicological Profile for Manganese, Agency for Toxic Substances and Disease Registry, September 2008.
- [US EPA, 1996](#), Manganese, Integrated Risk Information System, US Environmental Protection Agency, Reference Dose last updated May 1, 1996.
- [US EPA, 2003 \(PDF\)](#), Health Effects Support Document for Manganese, February 2003.
- [US EPA, 2004 \(PDF\)](#), Drinking Water Health Advisory for Manganese, January 2004.
- [WHO, 2004 \(PDF\)](#), Manganese in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, World Health Organization, 2004. See also: [WHO, Chemical Hazards in Drinking Water - Manganese](#).

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For Water Systems Providing Ground Water as a Source of Drinking Water

**TABLE 7 – SAMPLING RESULTS SHOWING
FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLES**

Microbiological Contaminants (complete if fecal-indicator detected)	Total No. of Detections	Sample Dates	MCL [MRDL]	PHG (MCLG) [MRDLG]	Typical Source of Contaminant
<i>E. coli</i>	(In the year)	0	0	(0)	Human and animal fecal waste
Enterococci	(In the year)	0	TT	n/a	Human and animal fecal waste
Coliphage	(In the year)	0	TT	n/a	Human and animal fecal waste

Summary Information for Fecal Indicator-Positive Ground Water Source Samples, Uncorrected Significant Deficiencies, or Ground Water TT

SPECIAL NOTICE OF FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLE

In February and May 2015, we had two tests that reported the presence of Total Coliform. We chlorinated the system and the following tests passed. We installed a chlorination system that went online in December, 2015.

Health Effects: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.

SPECIAL NOTICE FOR UNCORRECTED SIGNIFICANT DEFICIENCIES

None

VIOLATION OF GROUND WATER TT

TT Violation	Explanation	Duration	Actions Taken to Correct the Violation	Health Effects Language
None	TT means Treatment Technique; we started treating our water in December, 2015			

For Systems Providing Surface Water as a Source of Drinking Water

TABLE 8 - SAMPLING RESULTS SHOWING TREATMENT OF SURFACE WATER SOURCES

Treatment Technique ^(a) (Type of approved filtration technology used)	
Turbidity Performance Standards ^(b) (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 – Be less than or equal to ____ NTU in 95% of measurements in a month. 2 – Not exceed ____ NTU for more than eight consecutive hours. 3 – Not exceed ____ NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	
Highest single turbidity measurement during the year	
Number of violations of any surface water treatment requirements	

(a) A required process intended to reduce the level of a contaminant in drinking water.

(b) Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.

* Any violation of a TT is marked with an asterisk. Additional information regarding the violation is provided below.

Summary Information for Violation of a Surface Water TT

VIOLATION OF A SURFACE WATER TT				
TT Violation	Explanation	Duration	Actions Taken to Correct the Violation	Health Effects Language
None	We have only groundwater			

Summary Information for Operating Under a Variance or Exemption

Not applicable.